Tahoe National Forest, American River Ranger District / Yuba River Ranger District

SHORT-FORM BOTANICAL REVIEW

(Biological Assessment, Evaluation, Invasive Plant Risk Assessment, & Other Botanical Resource Assessment)

PROJECT NAME: Yuba Enhancement Restoration

QUAD(S): Mount Fillmore, Gold Lake, Downieville LEGAL SUBDIVISION: T20N & T21N, R10E & R11E S 13,35, 34,4,36,23,9,26,25

LOCATION: Project locations are north of Hwy 49 in the upper reaches of the Lavezzola Creek, Rattlesnake Creek, and Pauley Creek watersheds. The four proposed motorized trail re-routes and three unauthorized route removals are located within the East and West Yuba Inventoried Roadless Areas. The two proposed motorized connector trails lie outside the Inventoried Roadless Areas. Elevations range from 4,100 feet to 6650 feet.

PROJECT DESCRIPTION: The Forest Service is proposing the Yuba Trails Enhancement Project to: (1) four motorized trail re-routes followed by subsequent decommissioning and restoration of the replaced trail sections; (2) removal of three existing unauthorized routes through restoration to a natural state; and (3) construction one connector motorized trail on National Forest System lands on the Yuba River Ranger District of the Tahoe National Forest. The removal of existing routes will not involve ground disturbance and will be achieved with the use of route blocking methods such as boulders, down trees, and branches. Proposed re-route and connector trails will be constructed at a width of 24 inches-36 inches and brush removal of 5 feet from trail center.

Comment [MC-F1]: This is my language but not found in EA. Would be good to clarify in EA.

Trail Re-Routes: The four proposed motorized trail reroutes are designed to eliminate problems associated with overly steep and heavily eroding portions of the Rattlesnake/Downie River Trail, Pauley Creek Trail, Big Boulder Trail, and Lavezzola Trail as follows:

Downie River / Rattlesnake Trail : The Project would re-route approximately 1.5-miles of the steep existing Rattlesnake trail segment (25-40% grades) that is intercepting a drainage, and replace it with an approximately 2.5 miles of multiple use motorized single track trail with a grade of 5-10%. With the proposed re-route, the entire trail length will be called the Downie River Trail. The Project would decommission and restore the existing 1.5-mile steep section of trail (25-40% grades).

Pauley Creek Trail : The Project would re-route approximately 0.5 miles of a steep existing trail segment (25-35% grades) that climbs straight up and replace it with approximately 0.5 miles of multiple use motorized single track trail with grades of 5-10%. The Project would decommission and restore 0.5 miles of a steep existing section of trail (25-35% grades).

Lavezzola Trail: The Project would re-route approximately 2 miles of a steep existing trail segment (25-40% grades) that climbs straight up and replace it with approximately 3 miles of multiple use motorized single track trail with grades of 5-10%. The Project would decommission and restore the 2-mile steep existing section of trail (25-40% grades).

Big Boulder Trail: The Project would re-route approximately 1 mile of a steep existing trail segment (25-40% grades) that climbs straight up and replace it with approximately 1 mile of multiple use motorized single track trail with grades of 5-10%. The Project would decommission and restore the 1-mile steep existing section of trail (25-40% grades).

Connector Trail: Second Divide Trail: This proposed 0.15-mile connector trail is designed to enhance the safety and experience of users on First, Second and Third Divide Trails by building a trail that bypasses the County Road that connects the two popular trails. Currently a legal connection for motorcycle users does not exist as green sticker motorcycles are not allowed on roads not classified for their use under the *Tahoe National Forest Motorized Travel Management Record of Decision* (September 2010). This connector trail would also improve the user experience by creating a continuous single track

trail that extends Second Divide Trail with a connection to First Divide Trail. The new multiple use motorized single track trail would be designed with grades of 5-10%.

Unauthorized Route Restoration: The unauthorized route to Sisson Mine, an unauthorized route near Hawley Meadow (old Gold Valley), and unauthorized route near Butcher Ranch would be removed and the land restored to a natural grade. These routes are not needed for public use and are unsustainable. Approximately 3 miles of unauthorized routes would be restored to natural conditions.

1 PRE-FIELD RECORDS AND RESEARCH

The botanical species (plants, fungi, lichen) that are targeted for management on TNF (i.e. federally threatened and endangered; Forest Service Sensitive; TNF invasive plants; and TNF watch list) are listed into the following sections under Biological Assessment / Evaluation (BA/BE), Invasive Plant Risk Assessment (IPRA) and Other Botanical Resources Assessment (OBRA) respectively. The presence of target species and the likelihood of suitable habitat for TES species was determined by reviewing the US Fish and Wildlife List for TNF, the Region 5 Forest Service Sensitive Species list, TNF corporate datasets (NRIS) for TES occurrences, IP inventory datasets and TESP-IS surveys(USDA Forest Service 2015d), California Natural Diversity Database records(California Department of Fish and Wildlife 2016), and TNF corporate GIS datasets of vegetation, soil, elevation, aspect, meadows, fens, soil types and hydrologic features as well as personal knowledge of the project area (USDA Forest Service 2015a, USDA Forest Service 2015b, USDA Forest Service 2015c, USDA Forest Service 2009). Presence or absence of TES occurrences and suitable habitat is verified during field surveys. Pre-field research is incorporated into the BA/BE, IPRA and OBRA below.

2 FIELD RECONNAISSANCE SURVEY

Field reconnaissance surveys of the project area along 14.5 miles of proposed re-route and connector trails (169 acres) were conducted on 8/10/2016 and 6/102018 Lavezolla re-route (39120F7-16-01), 6/21/2018 Downie re-route (39120F7-17-01), 7/5/2018 Pauley re-route (39120F6-17-01), 6/13/2017 2nd Divide Trail (39120E7-17-01), and 7/7/2018 Big Boulder re-route (39120F6-17-01), by TNF botany crew members. The unauthorized route to Sisson Mine, an unauthorized route near Hawley Meadow (old Gold Valley), and unauthorized route near Butcher Ranch were not surveyed due to lack of ground disturbance for proposed road closure. 2018 follow up surveys will be conducted on Big Boulder re-route and Second Divide Connector trail due to changes in proposed trail locations following 2017 surveys. Surveys are floristic in nature, but focused on target species; they are timed to coincide with the flowering period of target species—particularly TES species—with the exception of FSS fungi which are usually fruiting only in early spring or late fall when other plants are dormant. Surveyors utilized 'intuitive control' survey method, which requires survey coverage of at least 25 percent in areas with low to moderate potential for target species and at least 50 percent in areas of high potential for target species. Surveys were conducted by walking the proposed trail construction flag line and proposed decommission roads. The proposed flagline was surveyed out at least 25 feet from trail center. Areas identified as having potential for target species were surveyed intensively. Presence or absence of suitable habitat for TES species is noted. If there are known occurrences of target species identified during pre-field research, they are revisited during field surveys to verify occurrence and geospatial accuracy.

Survey area elevations were between 3,600- 6,500 feet in elevation. Aspects varied in large drainages and slopes were generally steep (30%-50%) leading into drainages. Soils were dominated by Waca-Meiss complex (WDF), Waca-Windy complex (WAF), Smokey-Lorack-Cryumbrepts wet complex (SOF), and Rock outcrop metamorphic –Tinker-Cryumbrepts wet complex (MMRG).

Upper montane conifer forests (SMC, WFR, JPN) were found on the Downie/Rattlesnake, Pauley, Big Boulder, and Lavezzola re route and decommission trails. These forests were dominated by red fir (*Abies magnifica*), white fir (*Abies concolor*), Jeffrey pine (*Pinus jeffreyi*), sugar pine (*Pinus lambertiana*), and Douglas fir (*Pseudotsuga menziesii*).

Montane chaparral (MCP) vegetation type was found on Downie/Rattlesnake, Pauley, Big Boulder, and Lavezzola re route and decommission trails. This vegetation type was dominated by huckleberry oak (*Quercus vacciniifolia*), Greenleaf manzanita (*Arctostaphylos patula*), and pinemat manzanita *(Arctostaphylos nevadensis*).

Montane hardwood (MHW) vegetation type was found along riparian areas on Downie/Rattlesnake and Lavezzola re-route and decommission trails. This vegetation type was dominated by big leaf maple (*Acer macrophyllum*), black oak (*Quercus kelloggii*), Rocky Mountain maple (*Acer glabrum*) and dogwood (*Cornus species*).

Mining and recreation activities were noted in survey areas. Evidence of past mining activity and disturbance was found along the Lavezzola re-route and Downie/Rattlesnake re-route. Routes proposed for decommission were found to be steep and eroding.

Survey, TES and invasive plant records are on file electronically at TNF Supervisor's Office as well as in the Forest Service database of record—Natural Resource Information System (NRIS). Survey results are incorporated into the following Biological Assessment / Evaluation, Other Botanical Resources Assessment, and Invasive Plant Risk Assessment.

3 BIOLOGICAL ASSESSMENT / EVALUATION

This section discusses effects to TES botanical species (plants, fungi, lichen) from the proposed action.

3.1 Survey adequacy

Surveys completed at recommended intensity: ☐YES ☒ NO

Pre-implementation surveys are needed on the Boulder re route and 2nd divide extension due to changes in proposed routes surveyed in 2017. Surveys scheduled for 2018 season. Surveys were not conducted on the unauthorized route to Sisson Mine and unauthorized route near Hawley Meadow. Proposed action of restoration along these routes did not require ground disturbance activities.

3.2 TES Botanical Species and Suitable Habitat Presence

Table 1. List of all TES botanical species with known occurrences or suitable habitat on TNF. If suitable habitat or occurrences are known in the project area, it is noted.

Species	Common name	Suitable habitat characteristics	Known in project	Suitable habitat in project	Why habitat is not suitable
Ivesia webberi	**Webber's ivesia**	**4,500-6,500ft; east of Sierra crest; Lassen – Sierra counties; flats, benches, terraces or alluvial fans; well-developed, vernally moist, clayey soils with a very cobbled surface.**	**No**	**No**	**Outside species known range. Species known east of Sierra Crest in Dog Valley and Sierra Valley.**
Packera layneae	**Layne's butterweed**	**650-3,600ft; Tuolumne - Nevada counties; ultramafic soils (gabbro & serpentine); chaparral, conifer forest or woodland edges/openings**	**No**	**No**	**Outside species known elevational range. No ultramafic soils.**
Astragalus lemmonii	Lemmon's milkvetch	4,000-7,000ft in CA; east of Sierra crest; lakeshores, meadows & seeps among Great Basin scrub	No	No	Outside species known range. Known east of Sierra Crest.

Species	Common name	Suitable habitat characteristics	Known in project	Suitable habitat in project	Why habitat is not suitable
Astragalus pulsiferae var. coronensis	Modoc Plateau milkvetch	4,400-6,200ft; east of Sierra crest; Modoc – Plumas and Sierra Counties; Sandy or gravelly soils, often with juniper, pine or sagebrush	No	No	Outside species known range. Known east of Sierra Crest.
Astragalus webberi	Webber's milkvetch	2,400-4,100ft; east of Sierra crest; known only from Plumas County; dry forest openings/edges & semi-disturbed areas	No	No	Project area is outside geographic range of species, known only from Plumas NF.
Boechera rigidissima (Arabis rigidissima var. demota)	Galena Creek rock cress	Above 7,500ft; east of Sierra crest; known only in Placer County, California and Washoe County, Nevada; mesic areas (sometimes rocky) at red fir forest to aspen/meadow transitions.	No	No	Below species know elevational range and known only east of Sierra Crest.
Botrychium ascendens	upswept moonwort	Above 4,000ft (gen 5,000-7,500ft on TNF); wet habitats (riparian, seeps, meadows, etc.)	No	**Yes**	Suitable seep/spring and riparian habitat present in project area. Project area within known distribution and range of species.
Botrychium crenulatum	scalloped moonwort	Above 4,000ft (gen 5,000-7,500ft on TNF); wet habitats (riparian, seeps, meadows, etc.)	No	**Yes**	Suitable seep/spring and riparian habitat present in project area. Project area within known distribution and range of species.
Botrychium lunaria	common moonwort	Above 6,000ft in CA; wet habitats (riparian, seeps, meadows, etc.)	No	**Yes**	Suitable seep/spring and riparian habitat present in project area. Project area within known distribution and range of species.
Botrychium minganense	Mingan's moonwort	Above 4,000ft (gen 5,000-7,500ft on TNF); wet habitats (riparian, seeps, meadows, etc.)	No	**Yes**	Suitable seep/spring and riparian habitat present in project area. Project area within known distribution and range of species.
Botrychium montanum	western goblin	Above 4,000ft in CA; wet habitats (riparian, seeps, meadows, etc.)	No	**Yes**	Suitable seep/spring and riparian habitat present in project area. Project area within known distribution and range of species.
Bruchia bolanderi	Bolander's bruchia	Above 5,000ft in CA; montane meadows, stream banks, drying lake beds; on bare, semi-disturbed wet soils where competition is minimal	No	No	No suitable habitat found. No bare edges of semi disturbed soil.
Cudonia monticola	large cudonia	No elevation restriction; in duff; usually within old-growth conifer forests	No	**Yes**	Old growth Red fir forest present; more specific habitat suitability parameters unknown, not detectable at time of survey. Unlikely to be found in CA.
Cypripedium fasciculatum	clustered lady's slipper	Below 6,000ft on TNF; mesic, mid- to late-succession conifer or conifer-hardwood forests; north aspects; sometimes found with yew	No	No	No suitable habitat found. No mesic north facing conifer-hardwood forests.
Cypripedium montanum	mountain lady's slipper	1,500-6,500ft in CA; mesic to wet, mid- to late- succession conifer or conifer-hardwood forests; north aspects; often found under montane dogwood	No	No	No suitable habitat found. No areas of PPN forest, area dominated by ABMA/ABCO. No mesic north facing conifer hardwood forests.
Dendrocollybia racemosa	branched collybia	No elevation restriction; on decayed fungi or occasionally in duff; usually within old growth conifer or conifer-hardwood forests	No	**Yes**	Old growth Red fir forest present; more specific habitat suitability parameters unknown, not detectable at time of survey Unlikely to find this species above 3,500 feet elevation.
Erigeron miser	starved daisy	6,200-8,500ft; known only from Placer & Nevada counties; gravelly soils in crevices of near-vertical granite cliffs/faces	No	No	No suitable habitat found. No granite rock outcrops or gravelly soils.
Eriogonum umbellatum var. torreyanum	Donner Pass buckwheat	Above 6,800ft on TNF; dry, unstable, gravelly or stony soils; often on harsh exposures (e.g. ridge tops, steep slopes)	No	No	No suitable habitat found. Openings are present but substrate is not suitable; gravely silt-loam with no rocky volcanic substrate
Fritillaria eastwoodiae	Butte County frittilary	Below 4,900ft; full to partial sun; chaparral, woodland & conifer forest	No	No	Project above elevational range of species.

Species	Common name	Suitable habitat characteristics	Known in project	Suitable habitat in project	Why habitat is not suitable
Helodium blandowii	Blandow's bog-moss	Above 6,100ft in CA; usually found in bogs & fens, but sometimes seeps, wet meadows & under willows in riparian	No	No	No suitable habitat found. Project mostly below elevational range of species. No bog or fen habitat found.
Ivesia aperta var. aperta	Sierra Valley ivesia	5,000-6,000ft on TNF; east of Sierra crest; known only from Sierra & Dog Valleys; meadow edges, ephemeral stream channels, vernally wet flats & gentle, rocky slopes near springs	No	No	Project location outside species known range. Known from east of Sierra crest.
Ivesia aperta var. canina	Dog Valley ivesia	5,000-6,000ft; east of Sierra crest; known only from Dog Valley; meadow edges, ephemeral stream channels, vernally wet flats & gentle, rocky slopes near springs	No	No	Project location outside species known range. Known from east of Sierra crest.
Ivesia sericoleuca	Plumas ivesia	5,000-6,500ft on TNF; east of Sierra Crest; Plumas – Placer counties; vernally wet meadows & alkali flats	No	No	Project location outside species known range. Known from east of Sierra crest.
Juncus luciensis	Santa Lucia dwarf-rush	(925-)4,500-6,300ft (occurrences below 4,500ft only on south CA coast); known only from south CA coast, Modoc Plateau & east Nevada County; wet, sandy soils of seeps, meadows, vernal pools, streams, & roadsides	No	No	Project location outside species known range. Disjunct distribution and range of species. Closest known occurrences east of crest. No suitable habitat found.
Lewisia cantelovii	Cantelow's lewisia	1,000-4,500ft; known only from Yuba River drainage; wet rock cliffs & outcrops; usually with moss or club moss	No	No	No suitable habitat found. No rocky cliffs.
Lewisia kelloggii ssp. hutchisonii	Hutchinson's lewisia	4800-7,000ft on TNF; ridgetops or relatively flat open areas; generally full sun; gravelly soils	**Yes**	**Yes**	LEKEHTNF28 and LEKEHTNF27. Plants and suitable habitat found near Lavezzola and Downie proposed re route. Marginal habitat found on Butcher Ranch and Pauley re route.
Lewisia kelloggii ssp. kelloggii	Kellogg's lewisia	Above 6,500ft on TNF; ridgetops or relatively flat open areas; generally full sun; gravelly or sandy soils	No	**Yes**	Suitable habitat found near proposed re route trails. No plants found.
Lewisia longipetala	long-petaled lewisia	Above 8,300ft on TNF; El Dorado – Nevada counties; north-facing slopes and ridge tops often found in wet soils near margins of persistent snow banks	No	No	Project area below known elevational range of species.
Lewisia serrata	saw-toothed lewisia	3,000-5,000ft; known only from American River drainage; wet rock cliffs & outcrops; usually with moss	No	No	Project area outside species known range. Known only from American River drainages.
Meesia uliginosa	broad-nerved hump-moss	Above 6,000ft on TNF; usually found in bogs or fens, but also very wet meadows	No	No	No suitable habitat found in project area.
Mielichhoferia elongata	elongate copper-moss	Below 3,500ft; soils with copper or heavy metals; moist to wet rock cliffs/outcrops	No	No	Project area above known species elevational range. No suitable habitat found.
Monardella follettii	Follett's monardella	2,500-5,600ft; known only from Plumas County; serpentine soils; partial to full sun; conifer forest edges/openings	No	No	Project outside species known range. No ultramafic soils.
Peltigera gowardii	Goward's waterfan	1,150-7,000ft in CA; cold, clear, unpolluted streams; often found on rocks in cascades	No	**Yes**	Cascading cliffside stream found at Downie re route crossings.
Penstemon personatus	closed-throated beardtongue	4,500-6,500ft; Plumas – north Nevada County; partial sun; north aspects; conifer forest edges/openings	No	**Yes**	Moist mixed conifer and red fir forest found along Downie re route.
Phacelia stebbinsii	Stebbins phacelia	2,000-6,700ft; known only in Rubicon & American River drainages partial to full sun; generally in rocky openings/outcrops, but also woodland or conifer forest edges/openings	No	No	Project area outside known species range. Known only from American River drainages.
Phaeocollybia olivacea	olive phaeocollybia	No elevation restriction; Yuba County & north; on roots of Pinaceae & Fagaceae; usually within old growth conifer or conifer-hardwood forests	No	**Yes**	Old growth Red fir forest present; more specific habitat suitability parameters unknown, not detectable at time of survey Unlikely to find this species above 3,500 feet elevation.

Species	Common name	Suitable habitat characteristics	Known in project	Suitable habitat in project	Why habitat is not suitable
Pinus albicaulis	whitebark pine	Above 6,500ft on TNF; subalpine & at timberline on rocky, well-drained soils	No	No	Project below known elevational range of species. No subalpine habitat.
Poa sierrae	Sierra bluegrass	1,000-5,500ft; shady moist slopes; conifer forest edges/openings	No	No	Project area mostly above known elevational range. No suitable habitat found in RF forest.
Pyrrocoma lucida	sticky pyrrocoma	4,500-6,000ft on TNF; east of Sierra crest; known only from Plumas & Sierra Counties; vernally wet meadows & alkali flats	No	No	Project area not within known distribution of species. Known occurrences east of crest.
Sowerbyella rhenana	stalked orange peel-fungus	No elevation restriction; in duff; wet mossy areas; usually within old growth conifer forests	No	**Yes**	Old growth Red fir forest present; more specific habitat suitability parameters unknown, not detectable at time of survey Unlikely to find species at this elevation
Tauschia howellii	Howell's tauschia	5,500-8,500ft in CA; xeric ridge summits & slopes; decomposed granite gravel or sand; red fir & subalpine forest edges/openings	No	**Yes**	No areas of subalpine ridgetop, but some areas of LEKEH habitat might be marginal/suitable on Lavazzola and Downie re route.

3.2.1 TES Occurrences

Table 2. Known TES occurrences found near project area.

Species	Common Name	ID	Plant count	Acres	Last surveyed	Notes
Lewisia kelloggii ssp. hutchisonii	Hutchinson's lewisia	LEKEHTNF28	78	0.01	6/21/2017	Plants and habitat found along original flagline. Proposed route will be moved spring 2018 to avoid impact.
Lewisia kelloggii ssp. hutchisonii	Hutchinson's lewisia	LEKEHTNF27	32	0.01	6/21/2017	Plants and habitat found along original flag line. Flagline and proposed route changed 2017.

3.2.2 TES Suitable Habitat:

Suitable hbitat was found for 14 TES species (Table 3). No suitable habitat found for any other TES botanical species.

Table 3. Summary of species with suitable habitat but no known occurrences in project area.

Species	Common name	Suitable habitat characteristics	Project Unit
Botrychium ascendens	upswept moonwort	Above 4,000ft (gen 5,000-7,500ft on TNF); wet habitats (riparian, seeps, meadows, etc.)	Lavezolla Re-route, Pauley Re-route, and Downie Re-route stream crossings.
Botrychium crenulatum	scalloped moonwort	Above 4,000ft (gen 5,000-7,500ft on TNF); wet habitats (riparian, seeps, meadows, etc.)	Lavezolla Re-route, Pauley Re-route, and Downie Re-route stream crossings.
Botrychium lunaria	common moonwort	Above 6,000ft in CA; wet habitats (riparian, seeps, meadows, etc.)	Lavezolla Re-route, Pauley Re-route, and Downie Re-route stream crossings.
Botrychium minganense	Mingan's moonwort	Above 4,000ft (gen 5,000-7,500ft on TNF); wet habitats (riparian, seeps, meadows, etc.)	Lavezolla Re-route, Pauley Re-route, and Downie Re-route stream crossings.
Botrychium montanum	western goblin	Above 4,000ft in CA; wet habitats (riparian, seeps, meadows, etc.)	Lavezolla Re-route, Pauley Re-route, and Downie Re-route stream crossings.

Cudonia monticola	large cudonia	No elevation restriction; in duff; usually within old-growth conifer forests	Lavezolla Re-route and Downie Re-route.
Dendrocollybia racemosa	branched collybia	No elevation restriction; on decayed fungi or occasionally in duff; usually within old growth conifer or conifer-hardwood forests	Lavezolla Re-route and Downie re-route
Lewisia kelloggii ssp. kelloggii	Kellogg's lewisia	Above 6,500ft on TNF; ridgetops or relatively flat open areas; generally full sun; gravelly or sandy soils	Lavezolla Re-route, Pauley re-route, and Downie re-route
Peltigera gowardii	Goward's waterfan	1,150-7,000ft in CA; cold, clear, unpolluted streams; often found on rocks in cascades	Downie re-route stream crossings
Penstemon personatus	closed-throated beardtongue	4,500-6,500ft; Plumas – north Nevada County; partial sun; north aspects; conifer forest edges/openings	Downie re-route
Phaeocollybia olivacea	olive phaeocollybia	No elevation restriction; Yuba County & north; on roots of Pinaceae & Fagaceae; usually within old growth conifer or conifer-hardwood forests	Lavezolla Re-route and Downie re-route
Sowerbyella rhenana	stalked orange peel-fungus	No elevation restriction; in duff; wet mossy areas; usually within old growth conifer forests	Downie re-route
Tauschia howellii	Howell's tauschia	5,500-8,500ft in CA; xeric ridge summits & slopes; decomposed granite gravel or sand; red fir & subalpine forest edges/openings	Lavezolla Re-route and Downie re-route

3.3 Effects of Proposed Action

3.3.1 Hutchison's and Kellogg's lewisia (*Lewisia kelloggii ssp. hutchisonii* and *ssp. kelloggii*)

3.3.1.1 Species Account

The two subspecies of the perennial forb species *Lewisia kelloggii* are addressed together because it remains unclear whether the subspecies classification is justified (Slakey, Sims and Lazar 2013). Currently, the two taxa are separated based on petal length— greater than 20 mm in *subsp. hutchisonii*; less than 20 mm in *subsp. kelloggii*—and leaf size— greater than 4.5 cm long x 1 cm wide in *subsp. hutchisonii*; less than 4.5 cm long x 1 cm wide in subsp. kelloggii (Baldwin et al. 2012, Slakey et al. 2013). But, many occurrences do not key out clearly to one subspecies and genetic analysis could not conclusively separate the subspecies (Slakey et al. 2013). This is further complicated by the fact that the subspecies ranges and suitable habitat overlap (California Native Plant Society 2016). The species ranges as far north as Siskiyou and Humboldt County and south to Mariposa and Madera County (Slakey et al. 2013). As of 2013, CNPS estimated that there were a total of 17 occurrences of *subsp. kelloggii*, 22 occurrences of *subsp. hutchisonii*, and 31 occurrences that could not confidently be assigned to subspecies (Slakey et al. 2013). In CNDDB, these taxa are not tracked as the occurrence level (only the USGS quad level), so a current estimate of occurrences across the range is not available (California Department of Fish and Wildlife 2016). On TNF, as of 2017, there are 28 occurrences of Hutchinson's lewisia and 2 occurrences of Kellogg's lewisia (USDA Forest Service 2016).

3.3.1.2 Habitat Status

Suitable habitat for Hutchinson's and Kellogg's lewisia includes ridge tops or relatively flat open areas with widely spaced trees in partial to full sun in upper montane coniferous forests from 4,800 to 7,800 feet(California Native Plant Society 2016). It generally occurs on soils of decomposed granite, slate, or volcanic rubble (Baldwin et al. 2012, Slakey et al. 2013).

3.3.1.3 Threats / Management Concerns

While the species is considered globally secure (G3G4), both subspecies are considered globally vulnerable with taxonomy in question (T2T3Q) (NatureServe 2016). In California, there is moderate degree of threat and the species is listed as one for which more information is needed (California Native Plant Society 2016). Overall trend—for the species as a whole and the subspecies in particular—is uncertain. Hutchinson's and Kellogg's lewisia is primarily threatened by off-highway vehicle use. Other major threats include camping, hiking, horticultural collection (California Native Plant Society 2016).

3.3.1.4 Extent in project and botanical analysis area

During botanical survey of project area, two new occurrences of Hutchison's lewisia were documented along the Lavezzola re route and Downie re route. Patches of suitable habitat were found along all four of the proposed re route trails. Hutchison's and Kellogg's lewisia are spring ephemeral perennial herbs that are detectable only during a narrow window when succulent leaves and flowers are visible. After flowering the succulent leaves wither and the plant remains dormant underground undetectable. Since surveys were conducted at an appropriate season (May-June) for detection of the species, it can be assumed that plants did not go undetected in suitable habitat.

3.3.1.5 Effects from proposed action

Direct Effects

Based on limited scope of the proposed action (manual trail construction not extending beyond 5 feet of trail center) it is assumed there will be no effects to occurrences beyond 50 feet of proposed re-route. Direct effects to the new occurrences found along proposed re-route trails were mitigated by re alignment to buffer the know occurrences. 2017 initial analysis and assessment of long term monitoring plots on the TNF found that sites with OHV disturbance less than 20 meters from the plot had significantly lower density than sites without OHV disturbance (Patterson and Rowe 2017) Thus the greater the buffer applied to the known occurrences the better. The Lavezzola site was revisited in fall 2017 by Chelsea Morgan (botanist) and Paul Hart (recreation) to re align and flag the proposed route. The trail was moved uphill buffering occurrence by 50 feet to the edge of suitable habitat and a switchback through occurrence was eliminated (see Map 2). Steep terrain and rock cliffs prevented a larger buffer to the occurrence, but the lack of switchback and steepness of terrain will deter unauthorized OHV use down slope of trail. In spring 2018 the occurrence along the Downie re-route will be revisited and re aligned to avoid direct impact as well (see Map 3).

The project includes the following management requirements to further eliminate direct impacts from trail building and future OHV use for known occurrences near the Lavezzola and Downie/Rattlesnake re-route.

- Flag and avoid known occurrences and buffer ground disturbance by at least 50 feet.
- No staging of equipment or personal within known occurrences.
- Leave brush and obstructions between occurrence and trail within 50 foot buffer with sign indicating botanical resource protection.
- If feasible place trail downhill of suitable habitat near Downie re-route to deter shortcuts or unauthorized off trail use through suitable habitat.

Indirect Effects

Proposed action to re route trails has potential to effect suitable habitat for Hutchison's and Kellogg's lewisia. Proposed re-route trails and decommission trails cross through identified potential habitat on Lavezolla Re-route, Pauley re-route, and Downie re-route. Total estimated suitable habitat identified near proposed trail is 2.3 acres using aerial photography. These patches of suitable habitat were identified as forest openings with gravely well-draining soils. At these project locations above 4,800 feet in upper montane coniferous forests and montane chaparral, patches of suitable habitat are not abundant and can be geographically isolated. Impact to these patches of suitable habitat along proposed re-route trails will consist of soil disturbance of 24"-36" along length of trail and brush removal of 5 feet from trail center. While the trail prism effects will be long lasting due to initial soil disturbance and continued soil

compaction from use, the scale of the impact on overall suitable habitat will be negligible. The small distinct occurrences of known Hutchison's and Kellogg's lewisia within a larger area of suitable habitat is probably due to the lack of special mechanism for seed dispersal. The small seeds may be shaken or blown out of the capsule (Mathew 1989) and often buried before seed maturation where rodents digging to eat the taproot are important dispersal agents(Davidson 2000). Due to this short range potential for seed dispersal, it is important to protect habitat surrounding known occurrences. Trails near the known occurrences on Lavazzola and Downie re-route have the potential to indirectly impact suitable habitat of the Hutchison's and Kellogg's lewisia if unauthorized OHV and non-motorized use expands beyond the trail prism into surrounding suitable habitat. See previous management requirements that minimize impact to suitable habitat.
Patches of suitable habitat along proposed decommission trails will be less impacted from OHV and non-motorized use. While the trail prism along decommission trails will take many years to naturally restore to potential habitat, the surrounding potential habitat for Hutchison's and Kellogg's lewisia will have less impact from unauthorized off trail use.

Cumulative Effects
The analysis of cumulative effects is limited to the 15.5 miles of geographically distinct proposed re-route and decommission routes. The scope and scale of impacts on botanical resources are not expected to propagate further than 50 feet from trail prism into the future. The effects of past actions on Hutchison's and Kellogg's lewisia are largely unknown in these remote inaccessible areas. Since the species is not tolerant of soil disturbance it can be assumed that past mining activities, road building, and trail systems have reduced the abundance and distribution of the species and degraded habitat. Currently the project area has 8 miles of existing motorized use trails. Upon completion of proposed action there will be 7.15 miles of trails. The 7.15 miles of proposed re-route trails to be completed will be more constructed with a sustainable gradient that will reduce erosion and damage beyond the trail prism. Thus less trail mileage built in a more sustainable manner is expected to have negligible or minimal impact on future distribution and abundance of Hutchison's and Kellogg's lewisia. Decommission trails will take many years to retain attributes of suitable habitat, but immediate closure of motorized use on trails will eliminate potential unauthorized use in potential habitat. No other reasonable foreseeable future action is known for the project area which is all located on federal lands.

3.3.2 Species with suitable habitat, but no occurrences in project area
During surveys of the project area, suitable habitat was identified, but no occurrences were found for the species in Table 3. These species are discussed in aggregate because the potential for indirect and cumulative effects of proposed activities is similar despite having different suitable habitat characteristics. The scale and scope of potential indirect and cumulative effects is limited to suitable habitat within 50 feet of proposed re-route and trail decommission. It is assumed that indirect and cumulative effects will not propagate beyond 50 feet of trail. There are no known occurrences of species with potential suitable habitat within 1 mile of project areas, thus the likelihood of colonization of suitable habitat is very low. The indirect and cumulative effects of suitable habitat will be negligible in relation to potential habitat found throughout Tahoe National forest land. Total project acreage of potential impact is 136 acres (trail buffered by 50 feet) with isolated areas of potential suitable habitat in the form of stream crossings, old growth, and gravelly/rocky openings.

3.4 CONFLICT DETERMINATION:
It is my determination that the proposed action **will not affect** Hutchison's and Kellogg's lewisia (*Lewisia kelloggii* ssp. *hutchisonii* and ssp. *kelloggii).* My determination is based on a) lack of known occurrences within 50 foot buffer, b) management requirements to eliminate effects to nearby occurrences and suitable habitat, c) and the negligible scale and scope of indirect impacts to suitable habitat from proposed actions.

It is my determination that the proposed action **will not affect** upswept moonwort (*Botrychium ascendens*), scalloped moonwort (*Botrychium crenulatum*), common moonwort (*Botrychium lunaria*), Mingan's moonwort (*Botrychium minganense*), western goblin *(Botrychium montanum*), large cudonia (*Cudonia monticola*), branched collybia (*Dendrocollybia racemose*), Goward's waterfan (*Peltigera gowardii*), closed throated beardtongue (*Penstemon personatus*), olive phaeocollybia (*Phaeocollybia olivacea*), stalked orange peel fungus (*Sowerbyella rhenana*), and Howell's tauschia (*Tauschia howellii*). My determination is based on: a) lack of any known occurrences within 1 mile and b) small scale and scope of indirect impacts to suitable habitat from proposed actions. No suitable habitat was found for any other TES botanical species.

It is my determination that the proposed action **will not affect** any other federally threatened, endangered, or proposed botanical species. My determination is based on the lack of any T&E botanical species occurrences and the absence of suitable habitat known within the project area.

4 Other Botanical Resource Assessment

This section discusses any other botanical resources that may be affected by the project, including watch list species, special management areas, unique plant communities, and special habitat (e.g. fens, meadows).

Table 4. TNF Watch List

Species / Community	Common name	Habitat	Known in project
Allium jepsonii	Jepson's onion	900-4,400', foothill woodland, lower montane coniferous forest, serpentine or volcanic soils	No
Allium sanbornii var. *congdonii*	Congdon's onion	1,000-5,000', serpentine soils	No
Allium sanbornii var. *sanbornii*	Sanborn's onion	1,000-5,000', serpentine soils	No
Arctostaphylos mewukka ssp. *truei*	True's manzanita	2,500-6,000', chaparral and lower montane coniferous forest	No
Arctostaphylos nissenana	Nissenan manzanita	1,500 to 3,500', chaparral/closed-cone pine forest	No
Calochortus clavatus var. *avius*	clubhair mariposa lily	3,000-5,800', forest edges (ARRD), lava cap	No
Calystegia vanzuukiae	Van Zuuk's morning-glory	1640-3875', serpentine/gabbro soils	No
Cardamine pachystigma var. *dissectifolia*	serpentine bittercress	Openings below 6,900'	No
Carex davyi	Davy's sedge	4,800-10,600', subalpine/red fir forest	No
Carex lasiocarpa	woolly fruit sedge	1,900-6,900', fens, wet areas	No
Carex limosa	mud sedge	4,000-8,700', fens, wet areas	No
Carex praticola	meadow sedge	1,600-10,500', meadows/wet areas	No
Carex sheldonii	Sheldon's sedge	4,000-5,000', wet areas	No
Ceanothus arcuatus	Arching ceanothus	1,900', 7,025', serpentine soils	No
Chlorogalum grandiflorum	red hills soaproot	800-4,100', serpentine soils	No
Clarkia biloba ssp. *brandegeae*	Brandegee's claria	<3,100', forest edges/openings	No
Clarkia mildrediae ssp. *lutescens*	Mildred's clarkia	<5,750', woodland/forest edges	No
Clarkia mildrediae ssp. *mildrediae*	Mildred's clarkia	800-5,650', woodland/forest edges	No
Claytonia megarhiza	alpine springbeauty	Above 8,000', talus/rock crevices	No

Species / Community	Common name	Habitat	Known in project
Corallorhiza trifida	yellow coralroot	4,450-5,750', wet areas	No
Darlingtonia californica	California pitcherplant	Below 8,500', wetlands/riparian	No
Drosera angelica	English sundew	Below 7,000', wetlands/riparian	No
Epilobium howellii	Yuba Pass willowherb	6,000-9,000', wetlands/riparian	No
Epilobium luteum	yellow willowherb	4,900-5,600', wetland areas	No
Erigeron petrophyllus var. *sierrensis*	northern Sierra daisy	900-5,700', serpentine soils	No
Eriogonum umbellatum var. *ahartii*	Ahart's buckwheat	Below 6,600', serpentine soils	No
Eremogone cliftonii	Clifton's eremogone	1,490-5,850', opening in chaparral, montane coniferous forest	No
Glyceria grandis	American mannagrass	Below 6,890', riparian/wetland	No
Hemieva ranunculifolia	buttercup-leaf suksdorfia	4,900', 8,200', riparian/wetland	No
Horkelia parryi	Parry's horkelia	Below 3,400' openings/edges	No
Lilium humboldtii ssp. *humboldtii*	Humboldt lily	1,500-4,200', forest edges/openings	No
Lycopus uniflorus	northern bugleweed	Below 6,600', wetland/riparian	No
Meesia longiseta	meesia moss	All elevations, wetland/riparian areas	No
Meesia triquetra	meesia moss	4,200-9,700', primarily fens	No
Micranthes howellii	Howell's saxifrage	Below 3,000', wetland/riparian areas	No
Mimulus glaucescens	shieldbract monkeyflower	Below 4,100', forest edges/openings	No
Mimulus laciniatus	cutleaf monkeyflower	3,300-8,700', seeps in granite	No
Oreostemma elatum	Plumas alpine aster	3,200-6,700', wetland/riparian areas	No
Packera eurycephala var. *lewisrosei*	Lewis' groundsel	900-6,200', serpentine soils	No
Penstemon sudans	Susanville beardtongue	3,900-8,000', edges/openings	No
Perideridia bacigalupi	Mother Lode yampah	1,400-3,400', serpentine soils	No
Piperia colemanii	Coleman's piperia	3,900-7,600', coniferous forest	No
Potamogeton praelongus	whitestem pondweed	5,900-9,850, wetlands	No
Pseudostellaria sierrae	pseudostellaria	4,000-7,200', forest edges/openings	No
Rhamnus alnifolia	alderleaf buckthorn	4,500-7,000', wetland/riparian areas	No
Rhynchospora alba	white beaksedge	150-6,700, wetlands/riparian areas	No
Rhynchospora capitellata	brownish beaksedge	150-6,600 wetlands/riparian areas	No
Sanicula tracyi	Tracy's blacksnakeroot	300-5,200', openings/edges	No
Schoenoplectus subterminalis	swaying bulrush	2,400-7,400', wetlands	No
Scutellaria galericulata	marsh skullcap	4,000-7,000', streambanks	No
Sidalcea gigantea	giant	2,100-6,400', wetland/riparian areas	No

Species / Community	Common name	Habitat	Known in project
	checkerbloom		
Sedum albomarginatum	Feather River stonecrop	850-6,400', riparian/river canyons	No
Silene occidentalis ssp. *longistipitata*	western catchfly	3,200-6,600', forest edges/openings	No
Silene occidentalis ssp. *occidentalis*	western catchfly	4,000-6,900', forest edges/openings	No
Sphagnum species	peat moss	All elevations, fens/ peatlands	No
Stachys pilosa	hairy hedgenettle	3,900-5,850', wetland/riparian areas	No
Stellaria obtusa	Rocky Mountain checkweed	5,200-6,600', forest edges/openings	No
Stuckenia filiformis	fineleaf pondweed	980-7,055', wetlands	No
Tonestus eximius	Lake Tahoe serpentweed	8,000-10,000', granitic areas	No
Utricularia minor	lesser bladderwort	Above 1,500', shallow water	No
Veronica cusickii	Cusick's speedwell	Above 6,500', moist soils	No
Special aquatic features (SNFPA)	Fens	All elevations on the TNF, wet areas	No

TNF maintains a watch list of plant species that are of conservation concern, but have not been designated as Sensitive by the Regional Forester. This list includes species that are newly described; locally rare; range extensions or disjunct populations; plants of specific public interest; or species with too little information to determine their appropriate status.
Survey for and document occurrences of these species. Watch list species are to be considered during project planning, but are not included in the project's Biological Evaluation.

There are no watchlist occurrences or other botanical resources within the project area. No impacts are anticipated from proposed trail re-route and decommission.

5 Invasive Plant Risk Assessment

This section discusses risks from invasive plants associated with proposed action.

Table 5. Invasive plants of management concern on TNF. If infestations occur in project area, it is noted in the far right column.

Scientific Name	Common Name	CDFA	Cal-IPC	Known in project
Acroptilon repens	Russian knapweed	B	Moderate	No
Aegilops triuncialis	barbed goatgrass	not rated	High	No
Ailanthus altissima	tree-of-heaven	Not rated	Moderate	No
Arundo donax	giant reed	B	High	No
Bromus tectorum	cheatgrass	Not rated	High	No
Berteroa incana	hoary alyssum	Q	N/A	No
Carduus nutans	musk thistle	A	Moderate	No
Carduus pyconocephalus	Italian thistle	C	Moderate	No
Centaurea diffusa	diffuse knapweed	A	Moderate	No
Centaurea melitensis	Maltese starthistle	C	Moderate	No
Centaurea solstitialis	yellow starthistle	C	High	No
Centaurea stoebe	spotted knapweed	A	High	No
Chondrilla juncea	skeletonweed	A	Moderate	No

Cirsium arvense	Canada thistle	B	Moderate	No
Cortaderia selloana	pampasgrass	Not rated	High	No
Cytisus scoparius	scotchbroom	C	High	No
Dittrichia graveolens	stinkwort	Not rated	Moderate	No
Elymus caput-medusae	medusahead	C	High	No
Euphorbia oblongata	oblong spurge	B	Limited	No
Foeniculum vulgare	fennel	Not rated	High	No
Genista monspessulana	French broom	C	High	No
Hydrilla verticillata	hydrilla	A	High	No
Isatis tinctoria	dyer's woad	B	Moderate	No
Lepidium chalepensis	lenspod whitetop	B	Moderate	No
Lepidium draba	whitetop	B	Moderate	No
Lepidium latifolium	tall whitetop	B	High	No
Linaria dalmatica ssp. *dalmatica*	Dalmatian toadflax	A	Moderate	No
Lythrum salicaria	purple loosestrife	B	High	No
Myriophyllum spicatum	Eurasian water milfoil	C	High	No
Onopordum acanthium	Scotch thistle	A	High	No
Phalaris arundinacea	reed canary grass	Not rated	High	No
Rubus armeniacus	Himalayan blackberry	Not rated	High	No
Spartium junceum	Spanish broom	C	High	No
Ulex europaeus	gorse	B	High	No

CDFA: California Department of Food and Agriculture Noxious Weed List (http://www.cdfa.ca.gov/phpps/ipc/). A--Weeds for which eradication or containment is required at the state or county level. B—Weeds for which eradication or containment is at the discretion of the County Agricultural Commissioner. C--Weeds that require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner. Q—Weeds that require temporary "A" action pending determination of a permanent rating.
Cal-IPC: California Invasive Plant Council Online Invasive Plant Inventory (2006) (http://www.cal-ipc.org/ip/inventory/weedlist.php) High—Species having severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Moderate—Species having substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Limited—Species that are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Alert—Species with significant potential for invading new ecosystems.

There are no known invasive plant occurrences within project area. Only one Scotch Broom (*Cytisus scoparius*) is within one mile of project areas. All project areas except for the 2nd Divide Extension are located over 5,000 feet in elevation which makes the vulnerability to invasion low. Management requirements that include cleaning of equipment prior to use in project area and use of weed-free construction materials will minimize risk of introduction due to project activities.

5.1 Invasive Plant infestations known in the project area:

There are no invasive plant occurrences within the project area.

5.2 Habitat vulnerability & non-project related vectors:

Overall habitat vulnerability to invasive plant introduction is low due to the high elevation of project areas. All project areas apart from the 2nd Divide Extension are located over 5,000 feet in elevation. Many invasive plants do not survive at such elevations and natural spread by wind and water are not as likely uphill from lower elevations. Overall the project area is surrounded by intact mature forest and shrublands that are resistant to invasion. Existing trails in the project area are currently free of invasive plants and the proposed action to decommission those existing trails will further reduce potential for introduction. The creation of 7.15 miles of new trail has the potential to create a vector of introduction in new areas due to

users. Many mountain bike and motor bike users do not wash mud from tires of bikes which can spread seeds of invasive plants. Increased use of trail from bike use has potential to introduce invasive plants. The Downieville downhill trail system is a very popular and heavily used trail in the same watershed and elevations. New invasive plants have not been detected along this trail system due to increased use.

5.3 Habitat Alteration or Increased Vectors as a Result of Project:

Construction of 7.15 miles of proposed re-route trails will cause ground disturbance and the potential vector for introduction of invasive plants. Management requirements will reduce the risk of invasive introduction by cleaning equipment, utilizing weed free construction materials, and sources of revegetation approved by district botanist.

5.4 Anticipated Invasive Plant Response:

The anticipated invasive plant response to this project is **Low**. My assessment is based on a) lack of known invasive plant populations in project area and vicinity of 1 mile and b) project management requirements that reduce the risk of invasive plant introduction.

6 Botanical Resource & Invasive Plant Management Requirements

The following management requirements have been incorporated into project design to minimize impacts to TES & other botanical resources.

1. **Flag and avoid** known occurrences of Hutchison's lewisia (*Lewisia kelloggii ssp. hutchisonii*) and buffer ground disturbance by at least 50 feet. Known occurrences located on Downie and Lavezzola re-route.
2. **No staging of equipment or personal** within known occurrences of Hutchison's lewisia (*Lewisia kelloggii ssp. hutchisonii*). Known occurrences located on Downie and Lavezzola re-route.
3. **Leave brush and obstructions** between know occurrences of Hutchison's lewisia (*Lewisia kelloggii ssp. hutchisonii*) and trail within 50 foot buffer with sign indicating botanical resource protection. If feasible place trail downhill of suitable habitat near Downie re-route to deter shortcuts or unauthorized off trail use through suitable habitat surrounding known occurrence.
4. **Additional survey and undetected occurrences prior to implementation**. Big Boulder and 2nd Divide Extension proposed trails will be surveyed in 2018 due to changes in 2017 project design. Any additional TES or TNF watchlist botanical species or other botanical resources discovered prior to implementation will be flagged and avoided until assessed for impacts by District Botanist.

The following measures will be implemented to reduce the risk of invasive plant establishment and spread associated with proposed activities.

1. **Equipment Cleaning—**All equipment and vehicles (Forest Service and contracted) operating off-road must be free of invasive plant material before moving into the project area. Equipment will be considered clean when visual inspection does not reveal soil, seeds, plant material or other such debris. Cleaning shall occur at a vehicle washing station or steam-cleaning facility before the equipment and vehicles enter the project area.
2. **Project-related disturbance—**Minimize the amount of ground and vegetation disturbance. As necessary, reestablish vegetation on disturbed bare ground to reduce invasive species establishment; revegetation is especially important in staging areas.
3. **Weed-free construction materials—**All gravel, aggregate, fill, mulch, topsoil, erosion control materials and other construction materials are required to be weed-free. When possible, use

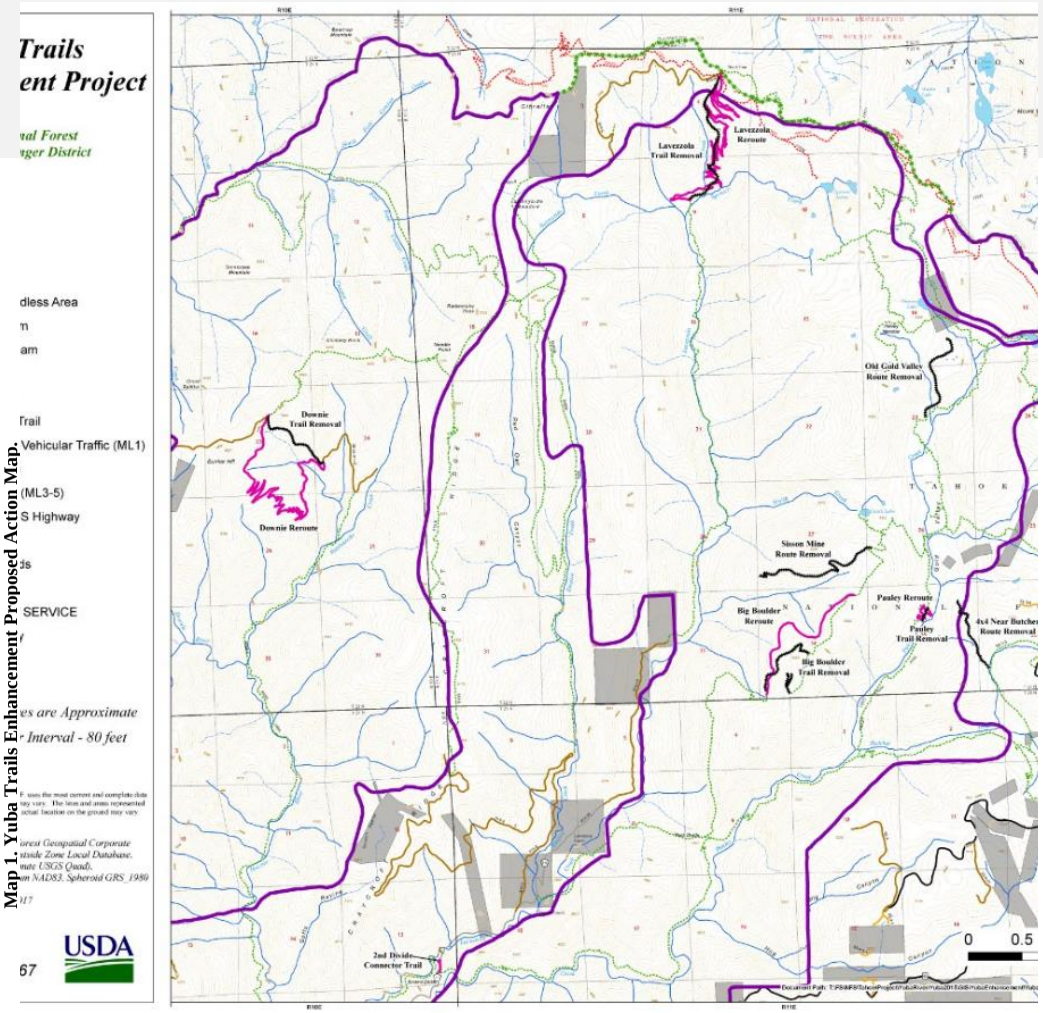
onsite materials, unless contaminated with invasive species. Otherwise, obtain weed-free materials from sources that have been certified as weed-free.

4. **Revegetation—**Seed and plant mixes must be approved the District Botanist. Neither invasive species nor persistent non-natives (e.g. Agropyron *cristatum*, Dactylis glomerata, Lolium spp.) *will not be used in revegetation*. Seed lots will be tested for weed seed and test results will be provided to District Botanist. Seed and plant material should be collected from as close to the project area as possible, preferably from within the same watershed or at similar elevation.
5. **Early Detection**—Any infestations discovered prior to or during project implementation should be flagged and avoided. Report new infestations to District Botanist.
6. **Post Project Monitoring–**For projects involving ground disturbance or use of imported materials, notify the District Botanist after the project is completed, so that the project area can be monitored for invasive plants subsequent to project implementation (as funding allows).

PREPARED BY: _____ DATE: 4-11-2018
Chelsea Morgan, Botanist

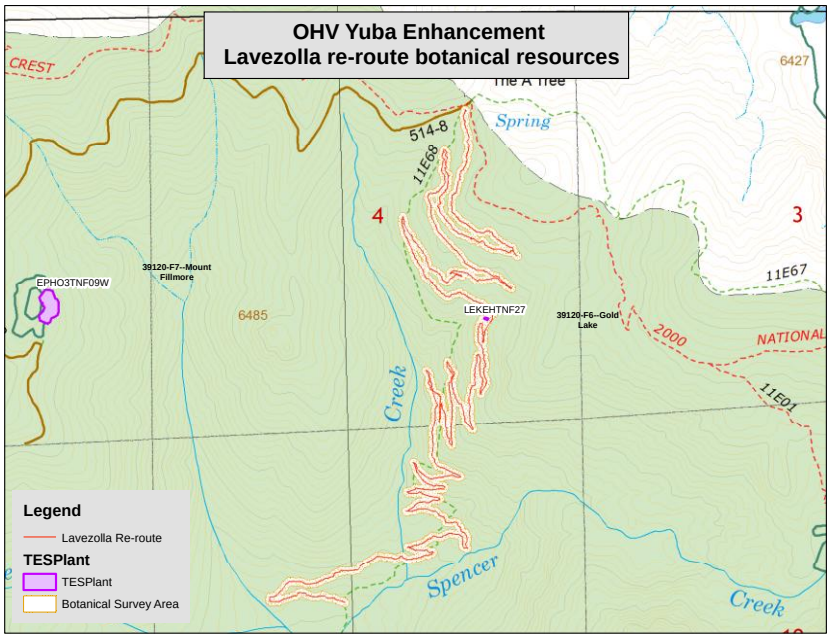
REVIEWED BY: _____ DATE:
Courtney Rowe, District Botanist

For this project, this memo documents completion of the Biological Assessment & Biological Evaluation process for Threatened, Endangered, and Forest Service Sensitive Plant Species as outlined in Forest Service Manual 2670—Threatened, Endangered, and Sensitive Plants and Animals (as amended by R5 direction)—as well as the Noxious Weed Risk Assessment as outlined in the 2004 Sierra Nevada Forest Plan Amendment.

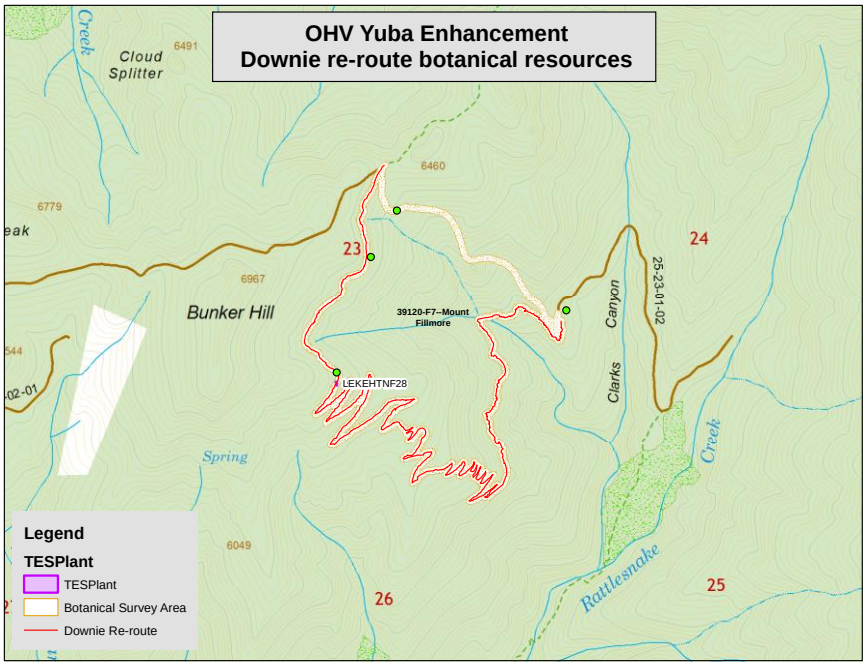


Map 1. Yuba Trails Enhancement Proposed Action Map.

Map 2. Known Hutchison's Lewisia near Lavezolla Re-route.



Map 3. Known Hutchison's Lewisia on Downie/Rattlesnake Re-route.



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